Buggin' Out (Identifying and Adding Amounts of Money)

Brief Overview:

Students will use play money to investigate the concept of addition of money with and without regrouping. Students will count sets of money including dollars, quarters, dimes, nickels, and pennies. Students will record money in various ways including the use of the ϕ symbol, dollar sign and decimal point, and picture representations. Students will develop an understanding of how to add money using the dollar sign and decimal point to make a connection from school-based learning to real-world application.

*This unit is designed for students who have already learned skills in addition with regrouping and counting money.

NCTM Content Standard/National Science Education Standard:

- 1. Understand numbers, ways of representing numbers, relationships among numbers, and number systems.
- Connect number words and numerals to the quantities they represent, using various physical models and representations
- 2. Compute fluently and make reasonable estimates
- Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals;

Grade/Level:

Grades 2-3

Duration/Length:

3 days (60 minutes per day) Day 3 will be used as an assessment day.

Student Outcomes:

Students will:

- Identify and name the value of pennies, nickels, dimes, and quarters.
- Determine the value of a given set of mixed currency up to \$5.
- Represent money amounts up to \$5 using both concrete and abstract representations.
- Add and subtract money amounts with and without regrouping.
- Solve word problems based on addition situations.
- Demonstrate proficiency with basic addition facts.

Materials and Resources:

Day 1:

For Teacher:

- Copy of Teacher Resource 10- "Assessment Document" filled out with all students names (to be used throughout the lesson)
- Overhead of Student Resource 1- "Money" cut into individual coins (have at least 10 of each of the following: quarters, dimes, nickels and pennies)
- Overhead of scenario about Johnny to use for the engagement
- One copy of Teacher Resource 1- "Allowance Scenarios" to use during the explain
- One piece of construction paper cut into 8" square
- One copy of Teacher Resource 2- "Pyramid Activity Directions" to read to students during the assessment

For Students:

- Dry erase board and marker (to be used throughout the lesson)
- Sandwich bags filled with the following (either for partners or individuals)
 - o 10 quarters
 - o 10 dimes
 - o 10 nickels
 - o 10 pennies
- One piece of construction paper cut into 8" square
 - o Additional sheets may be required for extension activity
- Coin stamps or copy of Student Resource 1- "Money"
- Scissors
- Glue
- Pencil
- Set of Teacher Resource 3-"Money Game" cut into squares and placed in baggies

Day 2:

For Teacher:

- Overhead of Student Resource 1- "Money" cut into individual coins (have at least 10 of each of the following: quarters, dimes, nickels and pennies)
- Pigs Will be Pigs by Amy Axelrod
- Magnetic money- at least 10 of each coin
- Chalk
- Chalkboard
- Overhead of centimeter grid paper
- One copy of Teacher Resource 4- "Rolling to One Dollar Game" to use as the set of directions

• Copy of Teacher Resource 10- "Assessment Document" filled out with all students names (to be used throughout the lesson)- can be used from the day before

For Students:

- Dry erase board and markers to be used throughout the lesson
- 1-2 pieces of centimeter grid paper
- Pencil
- One copy of Student Resource 2a "Rolling to One Dollar Recording Sheet"
- One set of Teacher Resource 5- "Coin Cubes" for partners
- Baggies of play money for the reteaching group that should include 10 of each of the following coins: quarters, dimes, nickels, and pennies.
- One copy of Student Resource 2b- "Rolling to 5 Dollars Recording Sheet" to be used for the extension
- One set of Teacher Resource 6- "Dollar Cubes" for each set of partners to use during the extension

Day 3:

For Teacher:

- Overhead of Teacher Resource 7-"Shopping Items" cut into individual items
- Copy of Teacher Resource 10- "Assessment Document" filled out with all students names (to be used throughout the lesson)- can be used from the day before
- Chart paper to be used for KWL chart
- Markers to be used for KWL chart
- Book about insects
- Overhead of Teacher Resource 8- "Insect Body Parts"
- Overhead of Student Resource 3- "Brief Constructed Response"
- Overhead of Teacher Resource 9- "Tarantula Scenario"
- Overhead or poster of Student Resource 4-" Bug Parts Price List"
- Overhead of Student Resource 5- "Cost sheet for Bug Parts" to be used as a model
- Overhead or poster of Student Resource 6- "Insect Template" to be used as a model

For Students:

- One copy of Student Resource 3- "Brief Constructed Response"
- One copy of Student Resource 4-" Bug Parts Price List"
- One copy of Student Resource 5- "Cost sheet for Bug Parts"
- One copy of Student Resource 6- "Insect Template" printed on white paper
- Crayons
- Pencil
- Calculator for the Reteach group
- Computer with internet access for extension activity

Development/Procedures:

Lesson 1

Pre-Assessment

- Distribute a dry erase board and marker to each student.
- Informally evaluate students' ability to recognize and record the name and value of a coin shown on the overhead by placing the following coins (from Student Resource 1) on the overhead one at a time: quarter, dime, nickel, and penny. Have students identify and record the correct name and value of each coin on their dry erase board. Be sure to include some pictures on the overhead of the "heads" and "tails" side of the coin.
- Record evaluation results on checklist (Teacher Resource 10).

Launch

- Activate the prior knowledge of the students by asking questions such as: "Who receives an allowance? How much do you receive? How do you receive it?" (i.e. If the student earns \$2, is it given in two dollar bills or a combination of coins and bills?).
- Tell students that everyone will receive an allowance, and will determine how much money is received. Show an example on the overhead. "For example: Johnny picked up all his toys. He earned a quarter and a dime. How much money did Johnny receive?" "Complete a Think-Pair-Share with a partner to find how much Johnny earned. Explain how you know that the amount is correct." Use the checklist (Teacher Resource 10) to assess the students' ability to count and record monetary amounts correctly.

Teacher Facilitation/Student Application

- Distribute bags of mixed coins, 10 of each coin (either to partners or individuals).
- Have students sort the coins into piles of like coins.
- Place a quarter, dime, nickel and penny on the overhead one at a time, and have students hold up the coin that matches. Review the value of each coin and how to write the value of each coin (i.e. quarter = 25¢, dime= 10¢, etc.)
- Pose a scenario of "Ways to Earn Allowance at School." "We earn allowance based on the jobs we complete. For example, if you complete your classroom job, you earn 1 dime and 2 nickels. How much allowance did you just earn? Place those coins in front of you and count the amount." Give students time to complete. Have students record answers on white boards. "Discuss with your neighbor how you counted the value of your coins." Call on a student to share with the class. "Did anyone count their coins in a different way?"
- Continue giving different scenarios (see Teacher Resource 1) for students to earn allowance in this way so they have had the opportunity to count different sets of coins and record the amount using the ϕ symbol.
- Put a quarter on the overhead. Ask students to tell the value of the quarter (25¢). Then, pose the question: "Is there another way to write the value of the quarter? Discuss with your groups and write your answers on your white

boards." Give students time to discuss the question and have them record their response on their white boards.

- Have students share responses. "Explain how you know this is another way to write the amount of money."
- Write the amount in all 3 ways, using a coin, a cent symbol, and a dollar sign and decimal point (example:



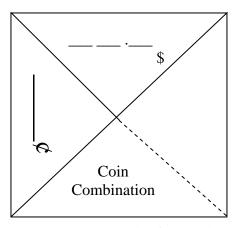
25¢

\$0.25

and explain that when writing money amounts, all whole dollars are recorded on the left side of the decimal point, with the dollar sign, and the change, or money not equal to a dollar, is written on the right side of the decimal point.

- Lead students back to the allowance scenarios, giving students an opportunity to write the amounts of money they have in both ways. For example, students can earn 2 quarters and 6 pennies for walking quietly to lunch. Ask the question: "How much money did you earn?" Students should write 56¢ and \$0.56. "How do you know? Is there another way to show the same amount of money?
- Continue practicing with varying amounts of coins with examples provided on Teacher Resource 1.

Embedded Assessment



- Distribute an 8" square of colored construction paper to each student.
- Follow the directions on Teacher Resource 2 to help students create the pyramid activity. Have each student stamp or glue a coin combination that is less than \$1, using the coins from Student Resource 1a-b, on one side of the pyramid.
- Write the total amount of money using the ϕ symbol on another side of the pyramid.
- Write the total amount of money using the dollar sign and decimal point on the last side of the pyramid. An example is shown to the left.

Reteaching/Extension

- Reteaching: Use the matching game (Teacher Resource 3a) to help students match the money amounts using the ¢ symbol to the dollar sign and decimal point representation, and/or picture representation.
 - Directions for the game:
 - Cut out one set of cards per pair and have in a small plastic bag for easy use.
 - Have students set all cards face up on the table.
 - Have students take turns matching three cards together (one card having the money amount with the φ symbol, one card having the money amount

with a dollar sign and decimal point, and the last card having the picture representation).

- Extension: Play a memory game using Teacher Resource 3b.
 - Cut out one set of cards per pair and have in a small plastic bag for easy use.
 - Have students set all cards face down on the table between the partners in five even rows (there should then be 6 in each row).
 - Have students take turns using their memory to match three cards together (one card having the money amount with the ϕ symbol, one card having the money amount with a dollar sign and decimal point, and the last card having the picture representation).
 - Make an additional pyramid with an amount of money larger than one dollar using the money amounts on Student Resource 1a and 1b.

Lesson 2

Pre-Assessment

- Distribute dry erase boards and dry erase markers to each student. Place 1 quarter, 1 dime, 3 nickels, and 2 pennies on the overhead.
- Have students count the value of the coins shown and write the amount using a dollar sign and decimal point on the dry erase board. They should write \$0.52. "Discuss with your partner how you counted this set of coins and how you knew to write your amount in that way." Repeat three times using the following sets of coins:

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2 quarters, 3 dimes, 8 pennies = $0.88
4 dimes, 6 nickels, 1 penny = $0.71
1 quarter, 10 pennies, 1 nickel = $0.40
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Launch

- Call students to an area to participate in a whole group activity. Tell students that they will join a pig family in a search for some money.
- Read the story, *Pigs Will be Pigs* by Amy Axelrod, stopping after identifying 3-4 money amounts that the pig family has found. Use the magnetic money to show how much money each pig finds on the board. Have students record (on white board) the amount using a dollar sign and decimal point. Example: Mr. Pig finds \$1.00 in his wallet. Place a dollar bill on the board. Give students time to record amount on white board using dollar sign and decimal point. Check student responses and record amount on the board, \$1.00.
- Move onto concept for the day: adding money amounts recorded using the dollar sign and decimal point symbols.

Teacher Facilitation/Student Application

• Have students work with a partner to find the total amount of money found by the pig family so far. Have students record answers on white boards.

- Choose a student work sample that correctly shows how to add money amounts together by lining up the decimal points and have student explain process used in solving the problem.
- Discuss the amounts of money that the pig family has found. Explain that when adding two amounts together that are written with a dollar sign and decimal point. Caution students to line up the decimal points properly. Show an example using grid paper to help students see how to line up the decimals. Example: Mr. Pig found a one dollar bill in his wallet. Mrs. Pig found two nickels, five pennies, and one quarter in her bedroom. This is how to set up the addition problem:

Explain that when adding money amounts that have a dollar sign and decimal point start with the number in the hundredths place (pennies). Put the decimal point for the answer just below where the decimal point is in the two addends. Add using regrouping if necessary (Sum will be \$1.40)

Distribute grid paper and have students complete another addition problem using the total amount of money found by Mr. and Mrs. Pig along with the amount found by the piglets to set up a new problem. Add these money amounts together, lining up the decimal points and using regrouping if needed. (New sum will be \$5)



- Have students add the fourth money amount and find the total amount found so far with a partner.
 - Read another page out of the book and have students (on their own) find the new total amount by adding the new value found to the previous total using their white boards.
 - Explain the rules of "Rolling to a Dollar" using Teacher Resource 4. Give each student a copy of Student Resource 2a to record the amounts rolled. Give each set of partners one set of dice (Teacher Resource 5).

Embedded Assessment

Formally observe students playing the "Rolling to a Dollar" game to determine whether they are correctly adding the money amounts together. Use Teacher Resource 10 to record student ability to add money amounts written with a dollar sign and decimal point. Assess the students based on this question: are the students lining up the decimal points to add?

Reteaching/Extension

- Reteaching:
 - Play the "Rolling to a Dollar" game. Work together as a group (including the teacher) to add money amounts and reach a dollar.
 - Use play money (dollars, quarters, dimes, nickels, and pennies) to further help students attain the concept of adding money using dollar signs and decimals.

• Extension:

- Play the "Rolling to Five Dollars" game using dice on Teacher Resource
 Have students record on Student Resource 2b.
- Use Amy Axelrod's website (<u>www.amyaxelrod.com</u>) for more lesson plans and reproducible materials that correlate with the story *Pigs Will be Pigs*.

Lesson 3

Pre-Assessment

- Place the pictures of a jack in the box and truck from Teacher Resource 7 on the overhead. Have students find the total price of the items by adding money using dollar signs and decimals. Students should add by lining up the decimal points, and have a total of \$3.58. Assess students using the checklist on Teacher Resource 10 asking the question: are students lining up the decimals and adding the amounts correctly?
- Repeat for a total of three times using the following combinations:

Airplane and kite: \$5.81

Teddy bear and rubber duck: \$3.63 Bicycle and Paddle ball: \$6.48

Launch

- Use a KWL chart to activate prior knowledge about insects with students. Fill in the K and W section of the chart with what students **K**now and what they **W**ant to know about insects. Read a book about insects to find more information about insects.
- Share pictures from Teacher Resource 8 and discuss basic parts of an insect (head, thorax, abdomen, eyes, antennae, wings, and legs)

Examples of books:

- Bugs Are Insects, by: Ann F. Rockwell
- Eyewitness Insect, by Laurence Mound
- *Insects*, by Steve Parker
- Everything Bug: What Kids Really Want to Know About Insects and Spiders, by Cherie Winner
- Simon & Schuster Children's Guide to Insects and Spiders, by Jinny Johnson
- Insects and Bugs (Curious Kids Guides), by Amanda O'Neill

Teacher Facilitation/Student Application

- Give students a copy of Student Resource 3. Read the scenario about the crickets and give students time to think about and answer the question. Students should be answering that the teacher will have enough money to purchase all eight crickets, and an example of the explanation could be:
- o If the teacher buys all eight crickets, the total will be \$2.00. She has \$2.19, so she has enough because \$2.19 is more than \$2.00.
 - Have students share their responses with others at their table. Choose a student work sample to be shared with the class. Ask the question: "How did you find your answer? How do you know that \$2.19 is more than \$2.00?"
 - Present students with another scenario (Teacher Resource 9) about finding a new insect for a pet tarantula to eat. Explain that today students will be creating a new insect by purchasing different insect parts. Show students a large version or overhead of Student Resource 4.
 - Put a copy/poster of Student Resource 6 on the board, and using prices and details from Student Resource 4, show students how to create a new insect. Use Student Resource 5 to record the price of the newly created insect, and make sure all required parts have been purchased.
 - Explain the directions for the assessment to students (Student Resource 5) and distribute all materials (Student Resource 4 and 6). Allow students time to create their insect. Assess students using the checklist on Teacher Resource 10 asking the questions: are the students using all parts of the insect necessary? Are the students staying within the limits of \$5?

Embedded Assessment

• Have students create their own insect and determine the total amount of money spent using Student Resource 4, 5, and 6.

Reteaching/Extension

- Reteaching:
 - Change amounts on Teacher Resource 3 to dollars without change. Example: Truck was \$1.08, change to \$1.00.
 - Give students a calculator to check all their work.
 - Do not give students a limit on how much money to spend. These students should be assessed on their ability to add money amounts using dollar signs and decimal points.
 - Give students grid paper to complete Student Resource 3.

• Extension

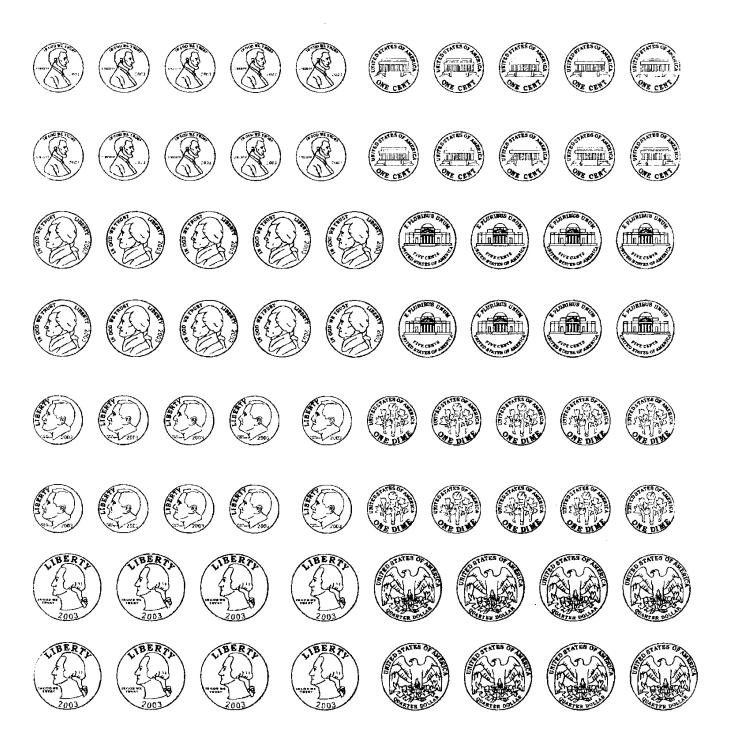
• Play a game on the computer using the U.S. Mint website. Provide an opportunity for students to reach the goal of \$5 by blowing bubbles from the sea diver pig's mouth to collect coins and save the boat from the sea monster. http://www.usmint.gov/kids/games/dollarDive/

Summative Assessment:

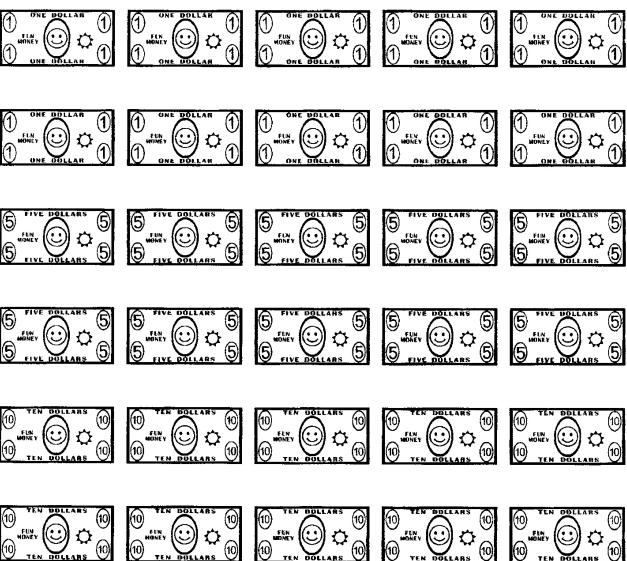
Students will be completing the summative assessment on Day 3 of this Concept Development Unit. On this day, students will show their understanding of recording and adding money amounts using dollar signs and decimal points by creating a new insect. Students will need to purchase different body parts for this insect and calculate the total cost. Students cannot spend more than \$5 on the new insect.

Authors:

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Student Resource 1b Money



Rolling to \$1.00



	Φ		
Roll #1	D_	<u> </u>	

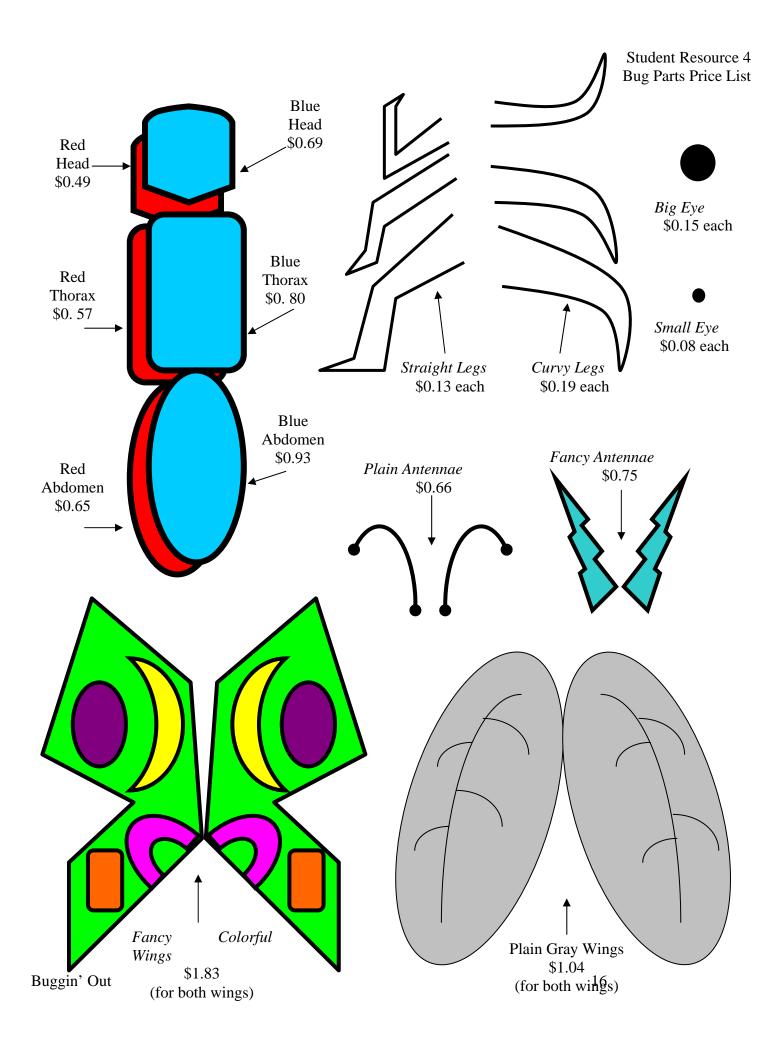
Rolling to \$5.00



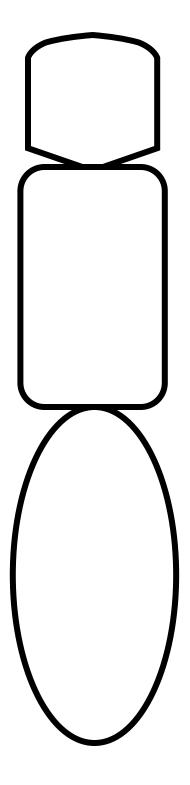
Roll #1	\$ •	
Roll #2	\$ •	
Subtotal		
Subiblai	 	

Subtotal	
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Student Resource 3 Brief Constructed Response Your teacher went to the pet store to buy 8 crickets to feed to her pet tarantula. Each cricket costs \$0.25. Part A If she has \$2.19 to spend will she have enough money to buy all 8 crickets? She will/will not have enough money (Circle one) Part B Use what you know about money and addition to explain how you solved this problem. Use number and/or words in your explanation.



\$5.00 to spend on your creation. You must include	-		·
☐ Head: color? ☐ Thorax: color? ☐ Abdomen: color?	Six legs: straight or curvy? Antennae: plain or fancy? Wings: fancy or plain? Eyes – 2 or more: how many?		
Use the space below to show the total cost of your inscost. Example: \$0.49 - red head \$0.80 - blue abdomen \$1.29		pel the prices	to show what each part
Head (color:	_)	•	
Thorax (color:	_)	•	
Subtotal \$			
Abdomen (color:)	•	
Subtotal \$			
Legs: (type:)	·	
Subtotal			
Antennae (type:)		_	
Wings (type:)			Don't forget – 2 or more eyes
Subtotal		1	Eye 1: \$ 0
Eyes (number:)			Eye 2: \$ 0 Eye 3: \$ 0
Grand Total of insect \$	·		Eye 4: \$ 0
		`	Eye 5: \$ 0
Buggin' Out			Total: \$ 0



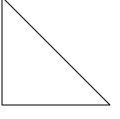
- 1. You completed your reading assignment, so you earned 1 quarter and 2 nickels. How much allowance did you receive?
- 2. You completed your morning work, so you receive 6 dimes and 2 pennies. How much allowance did you receive?
- 3. You were prepared with all your supplies, so you earned 9 nickels, 1 dime and 3 pennies. How much allowance did you receive?
- 4. Your friend dropped all their supplies. You helped them pick them up. You earned 3 dimes, 2 nickels and 2 quarters. How much allowance did you receive?
- 5. You received 7 dimes, 2 nickels, and 1 quarter for passing your math test. How much allowance did you receive?
- 6. You quietly walked to lunch today and earned 2 quarters, and 6 pennies. How much allowance did you receive?
- 7. You helped your teacher carry some supplies, so you receive 7 nickels, 1 dime and 8 pennies. How much allowance did you receive?
- 8. You assisted your teacher during Science today, so you earned 10 nickels, 4 dimes, and 1 quarter. How much allowance did you receive?

Teacher Resource 2a Pyramid Activity Directions

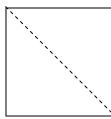
1. Start with an 8 inch square of paper.



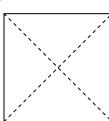
2. Fold the paper into a triangle by folding opposite corners together.



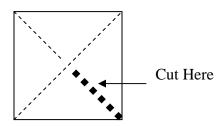
3. Open the folded shape and refold it the opposite way forming another triangle.



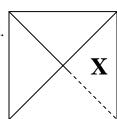
4. Open the folded paper to reveal an X.



5. Cut one of the folds to the center of the X, and stop.

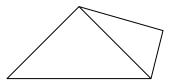


6. Place an X on one of the small triangle shapes beside the cut.



7. Complete the activity using the coin stampers as described in the lesson plan.

8. Complete the pyramid by gluing the flap with the **X** on it under the other flap beside the cut to form a pyramid.



Teacher Resource 3a Money Game

2003	25¢	\$0.25
	10¢	\$0.10
The state of the s	5¢	\$0.05
	1¢	\$0.01
2003 Company	48¢	\$0.48

Teacher Resource 3b Money Game

	51¢	\$0.51
000	67¢	\$0.67
	34¢	\$0.34
(III) (III) (III)	16¢	\$0.16
60000	97¢	\$0.97

Directions:

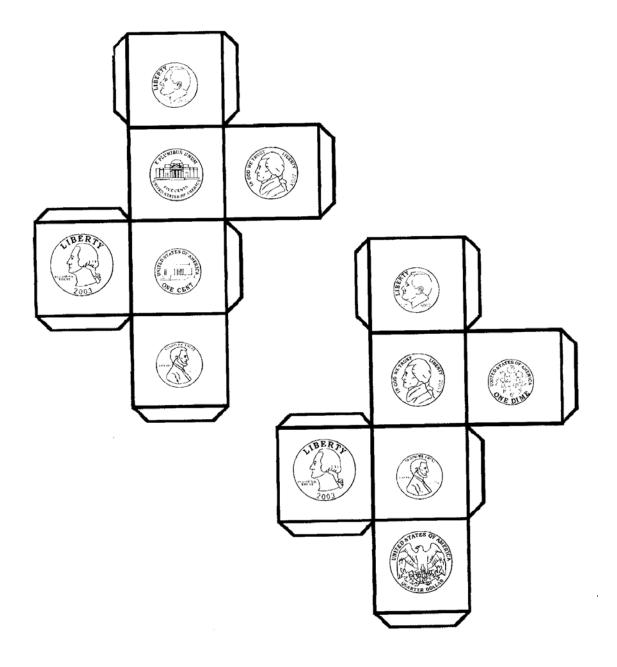
- 1. Students each roll 1 coin die from set #1. The person with the larger amount starts the game.
- 2. Student #1 rolls both dice. Student #1 adds the value shown on the dice and records the amount on the recording sheet. (Student Resource 2)
- 3. Student #2 rolls the dice and adds the value of the coins. Student #2 then records the total on their own recording sheet.
- 4. Student #1 then rolls again. Student #1 then records the amount <u>under</u> the previous amount and adds them together.
- 5. Student #2 then rolls the dice. Student #2 then records the amount <u>under</u> the previous amount and adds them together just as Student #1 has done.
- 6. Play continues this way until one person reaches or exceeds \$1.00.

Rolling to Five Dollars game

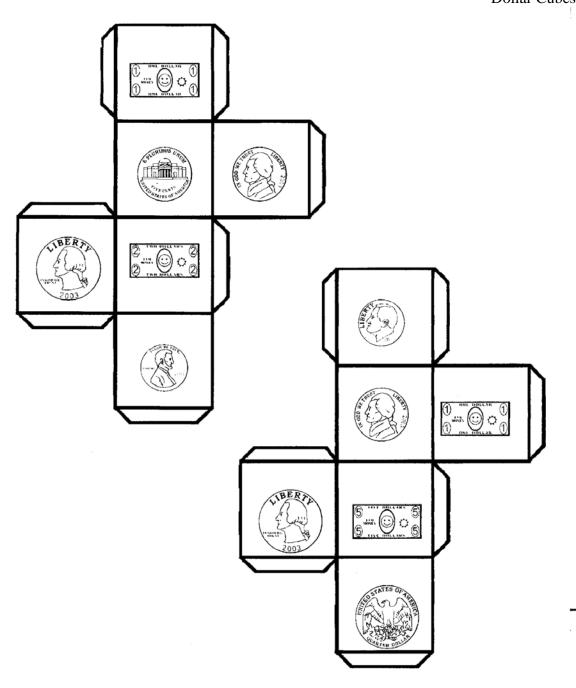
Directions:

- 1. Students each roll a die from set #2. The person with the larger amount starts the game.
- 2. Student #1 rolls both dice. Student #1 adds the value shown on the dice and records the amount on the recording sheet. (Student Resource 2)
- 3. Student #2 rolls the dice and adds the value shown on the dice. Student #2 records their total on the own recording sheet.
- 4. Student #1 then rolls again. Student #1 then records the amount <u>under</u> the previous amount and adds them together.
- 5. Student #2 then rolls the dice. Student #2 then records the amount <u>under</u> the previous amount and adds them together just as Student #1 has done.
- 6. Play continues this way until one person reaches or exceeds \$5.00.

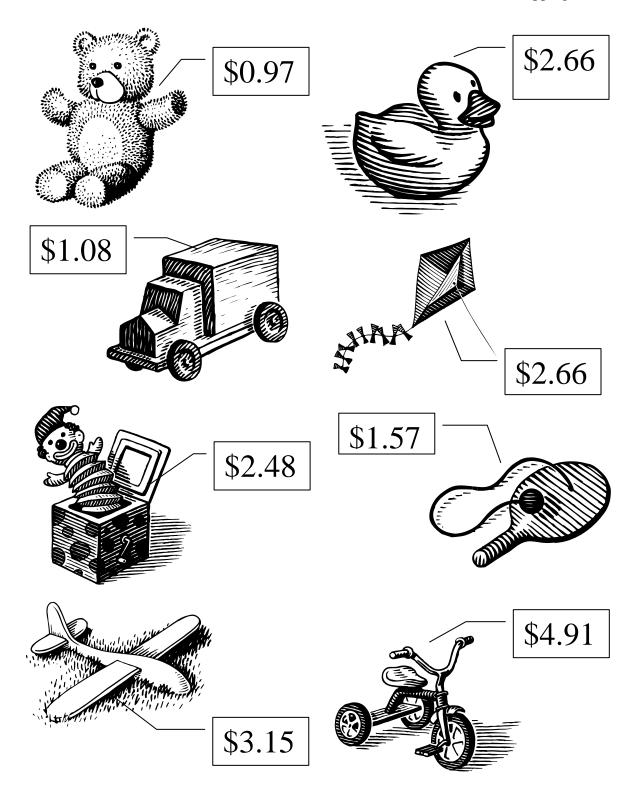
Teacher Resource 5 Coin Cubes

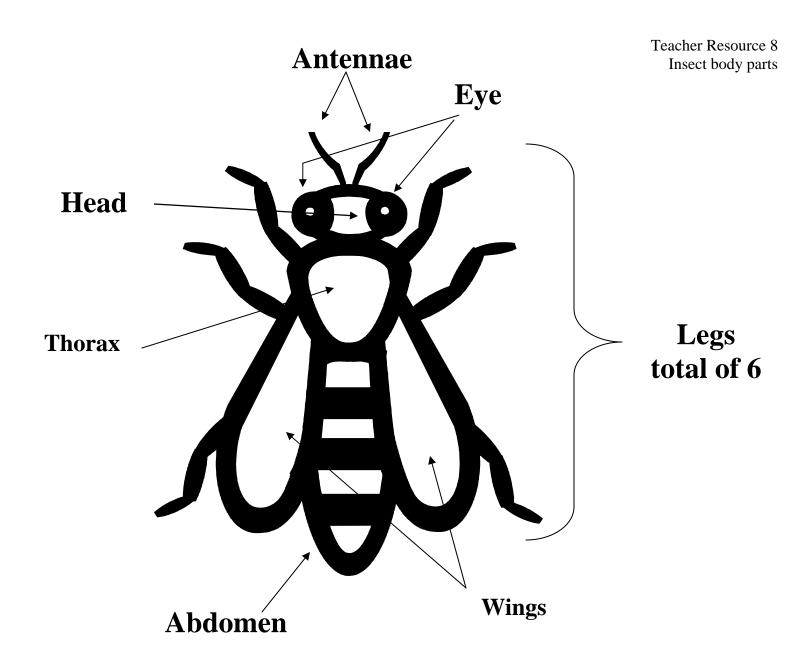


Teacher Resource 6 Dollar Cubes



Teacher Resource 7
Shopping Items





A friend of mine, John, has a pet tarantula named Fuzzy. Fuzzy likes to eat many different kinds of insects, especially green crickets. Unfortunately, the pet store where John used to get the green crickets no longer carries them. Now John is looking for a new insect to feed to Fuzzy. Your job today is to create a new insect that John could feed to Fuzzy.

Here are the basic rules you need to follow when creating your new insect:

- You will have only \$5.00 to spend on your insect creation.
- Your insect must have all the body parts of an insect.
 - o Head
 - o Thorax
 - o Abdomen
 - o 6 legs
 - o Antennae
 - o Eyes at least 2
 - o Wings

Teacher Resource 10 Assessment Document

	Lesson 1		Lesson 2		
Student Names	Visually recognize and record the name and value of a coin	Count and record monetary amounts correctly.	Record monetary amounts using dollar sign and decimal.	Lining up decimals and adding money correctly	Follo directic insect c